

## 2. Assessment of the Plan

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Meaningful assessment is integral to this plan. Each initiative, its objectives, and implementation actions will be regularly evaluated using a variety of assessment measures. The purpose of assessment for this plan is threefold. First, assessment measures will be used to determine how instruction affects students' critical thinking skills. In the initial stages of this plan, baseline measures of students' critical thinking skills will be taken in a variety of areas. Then, as the college begins enhancing its facilitation of these skills, regular assessments will indicate the effect of these enhancements on the baseline measures of students' critical thinking skills.

Second, the assessment of this plan will provide for evidence-based decision making about the most effective instructional strategies. Faculty, department chairs, and deans will use assessment results in identifying effective instructional strategies and professional development opportunities. Administrators will use assessment results to enhance curricular design and student services.

Third, the assessment of this plan will drive institutional change by moving the college's focus from teaching-centered to learning-centered by emphasizing results in the form of student learning outcomes. The assessment of this plan will also give the entire college community a greater stake in improving the educational experiences it offers. Assessing students' critical thinking skills will be the first step in a broader effort to improve the assessment of all learning outcomes.

This plan will employ both direct and indirect assessments of **student-learning outcomes**. **Direct assessments** of student-learning outcomes require evaluating genuine demonstrations of students' skills and knowledge, such as exams, essays, presentations, portfolios, and standardized tests. Direct assessments will provide the primary measures of success for this plan. **Indirect assessments** of student-learning outcomes evaluate secondary evidence of learning, such as student surveys, faculty surveys, exit interviews, assignment examples, course outlines, and completion rates. Such indirect assessments will supplement the data provided by direct assessments of student-learning outcomes.

Objective pre and post assessment tools will be selected to provide baseline measures of new students' critical thinking skills and subsequent measures as students move through the college's curricula. The tool tentatively selected for this purpose is the Cornell Critical Thinking Test Level Z (CCTT). Sample populations of two student groups will be given the CCTT each year: new students entering degree programs and students applying for graduation from degree programs. Changes in student performance will be analyzed in three areas: change at the individual level (pre to post); change at the cohort level (pre to post); and change from one year's post sample to the next (post to post).

Critical thinking rubrics have been used effectively at a number of schools, notably Washington State University and California State University, Fresno. Developing an institutional rubric encourages consistent evaluations of student work using common standards. Rubrics also have the advantage of being flexible enough to assess a variety of student work across a college's curriculum. The Verifying Examples of Critical Thinking Rubric (**Attachment V**) will provide quality subjective assessments of students' critical thinking skills. VECTR will identify specific performance descriptions for each of the four learning outcomes addressed in this plan. Any task that presents students with a genuine opportunity to demonstrate critical thinking will produce an artifact that can be assessed using VECTR. VECTR will be the primary instrument of assessment for the General Education Initiative, particularly student writing samples from ENG 111, and will be refined as an assessment tool through the implementation of this plan.

Another assessment tool will be developed to provide pre and post assessments of students' critical thinking skills in the Student Success course, ACA 111. This tool will derive its content from the critical thinking learning outcomes addressed in this plan as they apply to Student Success problems. This tool will consist of a combination of multiple choice and short answer questions that will simulate Student Success situations that require students to apply critical thinking skills. This tool will also serve as the common final exam for all ACA 111 sections.

In addition to directly assessing students' critical thinking skills using the tools described above, this plan will use a variety of indirect assessment measures. These measures will provide supplemental evidence of improved student learning over the course of this plan's implementation. Such measures include:

- Student surveys
- Faculty and staff surveys
- Employer surveys
- Senior institution surveys
- Course descriptions, outlines, and first day handouts
- Portfolios of instructional strategies
- Academic success and retention rates

The broadest variety of such measures, coupled with direct assessments of student-learning outcomes, will provide the college with a genuine and useful evaluation of the success of this enhancement plan.

## **2.1 Principles of Assessment**

Although critical thinking has been considered an essential educational outcome for some time, the assessment of students' critical thinking skills remains a challenge. This stems from: 1) a lack of agreement among educators on how to define critical thinking; 2) the logistical challenges inherent in assessing higher-order skills by objective standards; and 3) finding examples of student work that exhibit a minimally assessable level of critical thinking. The assessment of this plan will address both of these difficulties.

First, the college has established its own working definition of critical thinking. Based on this definition, four essential critical thinking learning outcomes have been identified:

Students demonstrate critical thinking learning outcomes when they

- Ask pertinent questions that clarify and focus a problem, scenario, or argument;
- Evaluate the quantity, quality, and usefulness of information;
- Articulate a sound solution, decision, or position based on appropriate standards of reasoning; and
- Monitor and reflect upon the quality and fairness of their reasoning.

These student-learning outcomes will be the focus of assessment, as they are the fundamental skills this plan seeks to improve. Making these common outcomes the basis of assessment will allow for both focused and holistic descriptions of students' critical thinking skills and their improvement over time. This will also ensure that assessments in different instructional areas attempt to measure the same basic skills. Additionally, based on these essential outcomes, more specific critical thinking learning outcomes will be identified at the course and program level.

Even with a shared description of critical thinking skills, the logistical challenge of isolating and measuring these skills remains. This is because students often apply critical thinking skills in conjunction with other skills, like written communication and quantitative reasoning, to complete a task. Most tasks that students complete are, in fact, evaluated for a wide range of applied skills

and knowledge that often involve some elements of critical thinking. The assessment of the learning outcomes addressed in this plan will attempt to separate critical thinking skills from the other skills students typically use to complete tasks. In order to do this, focused assessment tools will be developed based on the college's description of critical thinking and critical thinking learning outcomes. Tailoring these tools to the learning outcomes described above will provide a level of objectivity and consistency often lacking in the assessment of such higher-order skills. These tools will provide the primary means of direct assessment for this plan.

Another challenge in assessing students' critical thinking skills is the difficulty of gathering examples of student work that demonstrate critical thinking at a minimal level. This problem results from the unfortunate reality that many of the tasks students are asked to complete require no critical thinking whatsoever. Tasks that require only rote memorization and the regurgitation of received knowledge do not present students with an adequate opportunity to demonstrate their critical thinking skills. Assessing such tasks will yield no usable information about a student's level of critical thinking, regardless of what that level may be. Indeed, successful completion of these types of tasks may require students to think critically in terms of study strategies, careful review, and time management, but these examples cannot be effectively assessed based on the final product of student work in response to such tasks.

Therefore, effective assessments of students' critical thinking skills start with tasks that present genuine opportunities for students to apply critical thinking at a measurable level. Such tasks will often ask students to:

- Use the higher-order skills of analysis, synthesis, and evaluation
- Work with "ill-formed" problems that may be solved in a variety of ways
- Apply familiar concepts to novel situations
- Defend multiple positions on an issue
- Identify, find, evaluate, and use missing information
- Reflect upon and assess their work
- Design and conduct research projects
- Apply learning to "real-world" problems

These tasks replicate the complexities that students can expect to encounter in subsequent academic and professional contexts. Students responding to such tasks have an opportunity to demonstrate all or most of the critical thinking learning outcomes addressed in this plan at some level. Accordingly, successful assessment of these learning outcomes will require emphasizing such tasks and the student work they produce. This student work will be the object of this plan's direct assessment measures.

Finally, this plan will regularly use assessment data to refine and revise the implementation process. The steps outlined in this plan represent a sound research design that utilizes pre and post measurements of student learning so that accurate conclusions about the net effect of enhanced instructional and service strategies can be drawn. To this end, the effect of enhancement efforts on students' critical thinking skills will be measured for individual students, cohorts, and comparable samples of students over time. The results of these assessment efforts will not, however, be used to evaluate individual instructors or departments. Moreover, this assessment plan acknowledges the advice of Norris and Ennis (1989): "The most important principle to follow in evaluating students' critical thinking is that the evaluation itself should conform to the standards of critical thought" (p.182).

## **2.2 Assessment Tools**

As described above, this plan will utilize both objective tests and an institutional rubric for the direct assessment of student-learning outcomes. CFCC will administer the Cornell Critical Thinking Test Level Z (CCTT) to samples of degree program students at the beginning and completion of their coursework. An institutional critical thinking rubric will be developed and applied to samples of student work in general education courses. A common pre and post assessment comprised of multiple choice and short answer questions will be developed for ACA III: College Student Success. This plan will also utilize several indirect tools to supplement direct assessments of students' critical thinking skills. Taken together, these direct and indirect assessment tools will yield actionable information at the course, program, and institutional level.

### **2.2.1 Direct Assessment**

The Cornell Critical Thinking Test Level Z (CCTT) was chosen as the primary objective tool for its correlation to the learning outcomes addressed in this plan, substantial validity and reliability data, affordability, and ease of administration. Level Z is the more advanced of two Cornell tests (Level X being less advanced) and is most appropriate for college-level learners. It is based on the work of Robert H. Ennis and others that established a conception of critical thinking as "reasonable and reflective thinking focused on deciding what to believe or do" (Ennis, Millman, & Tomko, 2005, p.1). The "aspects" of critical thinking tested by Level Z include induction, deduction, observation, credibility, assumptions, and meaning (Ennis, Millman, & Tomko, 2005, p.2). Disposition to think carefully is measured indirectly by a scoring formula of rights minus half wrongs (Ennis, Millman, & Tomko, 2005, p.7). The test consists of 52 multiple-choice items to be completed by students in 50 minutes.

The utilization of the CCTT will be integrated into faculty participation in College Learning Communities (CLCs). CLC participants will choose to use CCTT Level Z one of three ways:

1. Administer to students as a pretest at the beginning of the term and posttest at the end of the term to determine the value-added impact of instructional enhancements. Posttest results will also be compared to results from other student samples. **(Preferred Method)**
2. Administer to students late in the term as a summative assessment of students' critical thinking skills. These results will be used as comparative data with results from early-term administrations of the test in other classes. Late-term testing of similar student cohorts will be done for two to three subsequent semesters to measure the impact of professional development and instructional enhancement activities.
3. Administer to students at the beginning of the term and use results to discuss critical thinking with students. These results will also be used as comparative data with results from late-term administrations of the test in other classes.

The results of each method of CCTT administration will also be analyzed for program of study and credit hours completed. In this way, the CCTT data will reflect the impact of CLC participation as well as curricular-wide improvements in students' critical thinking skills. The usefulness of CCTT and the quality of the assessment information it yields will be evaluated throughout the implementation process. Other methods of administering the CCTT, as well as other commercially available objective assessments of critical thinking will also be considered.

Another assessment tool will be developed for the ACA III: College Student Success course. A series of multiple-choice and short answer questions requiring the application of critical thinking skills to Student Success problems will be embedded in the course's common pre and post exams. These questions will also be designed to assess each of the learning outcomes addressed in this

initiative. This assessment tool will provide useful data on students' critical thinking skills gains upon completing this enhanced course.

To provide a more complete evaluation of student learning, this plan will use a method of assessment that applies a common rubric to examples of student work. This method has been adopted at many colleges and universities because of several upsides: it uses authentic examples of students' work; it does not take time away from normal instruction; it produces rich descriptions of student performance; it can be applied to a variety of student work. This process of assessment using a comprehensive rubric is based on the *Institutional Portfolio* model developed by Johnson County Community College (Overland Park, Kansas) and adopted by many other colleges, including Oklahoma State University and Surry Community College (Dobson, North Carolina). The institutional portfolio model evaluates examples of student work ("artifacts") from randomly selected general education courses (Seybert & O'Hara, 1997, p.5). Instructors in the selected courses are notified early in the semester of the request for artifacts. The instructors then choose (or develop) an assignment (project, paper, exam, presentation, etc.) they feel requires the general education learning outcomes in question. Once students have completed this assignment, copies of the student work are made with student and instructor names removed, and are forwarded to an interdisciplinary assessment team (Seybert & O'Hara, 1997, p.5). Then, this collection of student artifacts from across the general education curriculum is evaluated using an institutional rubric. Finally, the results of the rubric evaluation are shared with the general education faculty so that the appropriate instructional enhancements can be identified (Seybert & O'Hara, 1997, p.5).

Two pieces of valuable information will result from this model. First, it will provide an authentic description of students' critical thinking skills as they are applied to course work. Second, it will determine how many general education courses present students with assignments that require critical thinking. Johnson Community College currently requires an assignment to present students with the opportunity to demonstrate at least three components of a given learning outcome (Problem Solving Outcome, 2005, par.3). If an assignment fails to do this, it is not assessed for any level of learning outcome. A similar requirement will be put in place for CFCC's portfolio process and a brief guideline for designing assessable assignments will be provided for faculty. Assisting faculty in creating such assignments or modifying existing ones will also be addressed by the professional development initiative. From one year to the next, the number of non-assessable artifacts/assignments will be expected to decrease while the quality of assessable artifacts increases. This model will be refined to meet the unique needs and organizational culture of CFCC. Ideally, this model will prove effective for the college and be expanded to assess additional learning outcomes.

The college has developed a Verifying Examples of Critical Thinking Rubric (VECTR) as its common rubric (**Attachment V**). This tool, like others used in this plan, will be derived from the college's description of critical thinking learning outcomes. For each learning outcome, VECTR will provide descriptions of *deficient*, *developing*, *competent*, and *advanced* demonstrations of critical thinking. Student artifacts will be assessed with VECTR to produce a holistic score between one and four, one representing "deficient" and four representing "advanced." Artifacts yielding useful assessment data will result from students engaging with complex, "ill-formed" tasks that present genuine opportunities for the application of critical thinking skills. **Attachment VI** details the logistics of this process.

In the initial stages of this plan VECTR will be applied to student artifacts from a variety of courses in order to refine its application. Interdisciplinary assessment teams will evaluate batches

of student artifacts from selected courses, beginning with ENG 111: Expository Writing (see **Attachment VII** for initial results). These artifacts will be used to normalize the specific descriptions of the four levels of critical thinking described above. The results of these initial assessments will refine the application of VECTR to student work and provide a qualitative baseline measurement of students' critical thinking skills in selected courses. Another sampling of student artifacts from general education courses will be gathered during the academic year 2007-2008. These artifacts will be assessed by compensated interdisciplinary teams in the summer of 2008. The results of this assessment will provide the primary baseline measurement of students' critical thinking skills for the General Education Initiative.

### **2.2.2 Indirect Assessment**

Several indirect assessment tools will be used to supplement the direct assessment of students' critical thinking skills. These indirect assessments will provide supporting evidence of the success of this enhancement plan.

#### Community College Survey of Student Engagement (CCSSE)

As described in the "Background and Rationale" section of this plan, the Community College Survey of Student Engagement (CCSSE) which was administered to randomly selected students in 2004-2005 revealed statistically significant shortfalls in students' responses to questions relating to critical thinking compared to students at similar institutions. CCSSE will be re-administered to randomly selected students in 2008 and 2011. Students' responses to six questions directly related to critical thinking will be analyzed for positive change. CCSSE will provide the college with reliable evidence of students' perceptions of the impact of instruction on their critical thinking skills.

#### Student, Faculty, Staff, and Employer Surveys

The college will also utilize several new and existing survey instruments to assess the improvement of students' critical thinking skills. These instruments will be applied at the individual, course, and program level. In addition to student surveys completed at the course level, faculty and staff will describe their perceptions of students' critical thinking skills each year of this plan. Employers will also be asked to evaluate the critical thinking skills of the students they hire as part of the college's existing employer satisfaction survey. Graduating students will also evaluate their gains in critical thinking as part of the college's exit survey process.

#### Course Outlines, Program Descriptions, and Instructional Portfolios

Another indirect measure of students' critical thinking skills will come in the form of instructional portfolios. Every program of study will incorporate the learning outcomes addressed in this plan into course outlines and program descriptions. Additionally, each instructional department will compile an Instructional Portfolio of lesson ideas, assignments, and student work highlighting strategies that facilitate students' critical thinking skills. Faculty and staff participation in professional development activities associated with this plan will also be used as evidence of success.

## **2.3 Measures of Success**

The assessment principles and tools described above will be used to determine if this plan meets the following measures of success.

### **2.3.1 Professional Development Initiative**

The success of this initiative will be measured by these standards:

- 1) By 2008, 70% of full-time faculty will have completed at least one self-paced course on critical thinking instruction.
- 2) By 2009, every instructional area will have identified critical thinking student learning outcomes at the course and program level.

### **2.3.2 Student Success Initiative**

The success of this initiative will be measured by these standards:

- 1) Eighty percent of students completing the CT enhanced ACA course will demonstrate significant gains in their ability to apply critical thinking skills to Student Success problems on common pre and post exam (ongoing assessment beginning in Fall 2007).
- 2) Students completing CT enhanced ACA course and/or student success workshops will achieve at higher levels than non-completers based on G.P.A., retention rates, satisfaction surveys, and exit CT exam (ongoing assessment beginning in Spring 2008/Fall 2008).
- 3) Participation in student success workshops will increase each year (ongoing assessment beginning Spring 2007)

### **2.3.3 General Education Initiative**

The success of this initiative will be measured by these standards:

- 1) The level of critical thinking demonstrated by students on the ENG 111 common final will increase every year of this plan.
- 2) By 2011, 70% of students in randomly selected general education courses will demonstrate critical thinking at a competent level (assessment of student artifacts using CFCC's critical thinking rubric).

### **2.3.4 Global Assessments**

The cumulative outcomes of the three initiatives comprising this plan will be measured by these standards:

**First Outcome: Measurable improvement of students' critical thinking skills at the course, program, and curricular levels**

**Measures of Success:**

- 1) Student performances on objective tests of critical thinking skills will improve every year of this plan.
- 2) Student responses to CCSSE questions relating to critical thinking will indicate improvement with each administering (2008, 2011).
- 3) By 2011, 70% of students in randomly selected general education courses will demonstrate critical thinking at a competent level (assessment of student artifacts using CFCC's critical thinking rubric).
- 4) Faculty, staff, senior institutions, and employer descriptions of students' critical thinking skills will indicate continued improvement (ongoing assessment).

**Second Outcome: Enhanced instructional practices that promote critical thinking and life-long learning**

- 1) Faculty participating in College Learning Communities (CLCs) will document Instructional Design Enhancement Actions (IDEAs) demonstrating improved instructional strategies (ongoing)
- 2) Faculty and support staff will contribute lesson ideas, activities, and samples of student work to physical and online resources collections (ongoing)
- 3) Faculty and support staff participating in onsite and offsite professional development activities will complete pre and post surveys describing the impact of the training on their abilities to improve students' critical thinking skills (ongoing)

**Third Outcome: Improved strategies for assessing student learning outcomes**

- 1) CFCC will refine its common critical thinking rubric and the Institutional Portfolio model of assessment (ongoing)
- 2) CFCC will revise its student, faculty, staff, and employer surveys to better assess gains in students' critical thinking skills (ongoing)

**Fourth Outcome: More effective professional development opportunities for faculty and support staff**

- 1) Faculty and support staff participation in professional development activities will increase (ongoing)
- 2) Faculty and support staff will report greater satisfaction with the professional development activities made available (ongoing)
- 3) Faculty and support staff participating in onsite and offsite professional development activities will complete pre and post surveys describing the impact of the training on their abilities to improve students' critical thinking skills (ongoing)

Each initiative has common and specific measures to determine its level of success. The overall assessment of each initiative and the quality enhancement plan as a whole will be integrated into the college's institutional effectiveness and research processes. At the conclusion of the fifth year of this plan's implementation, each initiative will be evaluated using these measures of success. These evaluations will be the basis for this plan's five-year impact report.

## 2.4 Assessment Calendar

Date	Assessment Tool	Description	Use of Results
Summer 2006	Institutional Portfolio/ VECTR	Samples of ENG 111 common finals will be assessed by an interdisciplinary team	A baseline for students' critical thinking skills in ENG 111 will be established; VECTR and the assessment process will be refined
Fall 2006/ Ongoing	Pre and post faculty workshop surveys (to be developed)	Faculty participating in QEP workshops will be given pre and post surveys to assess the impact of the training sessions	Results will be used to improve subsequent faculty workshops
Fall 2006/ Ongoing	CCTT Level Z	CCTT will be utilized by CLC participants to assess students' critical thinking skills at different intervals	CCTT data will reflect the impact of CLC participation on student learning as well as curricular-wide improvements in students' critical thinking skills
Fall 2006	Post-test survey (to be developed)	Students will complete a brief survey after completing the CCTT Level Z	Student perceptions of and reactions to CCTT Level Z will be used to evaluate efficacy of test
Fall 2006/ Ongoing	Student Evaluation Forms (to be revised)	Specific questions about students' perceptions of critical thinking gains will be integrated into regular evaluation process	Departments will use student responses to monitor instructional emphasis on critical thinking
Fall 2006/ Ongoing	Employer surveys (to be revised)	Employers will be asked about the critical thinking skills of the CFCC graduates they hire	Employers' responses will be used to gauge to what extent students can apply critical thinking skills in the workplace
Fall 2006/ Ongoing	Transfer student surveys (to be revised)	Transferred students will be asked how well their time at CFCC prepared them to apply critical thinking skills to course work at senior institutions	Transferred students' responses will indicate the relationship between CFCC's emphasis on critical thinking and students' academic success at senior institutions

<b>Date</b>	<b>Assessment Tool</b>	<b>Description</b>	<b>Use of Results</b>
Spring 2007/ Ongoing	Instructional Design Enhancement Actions (IDEAs) collections	Faculty completing self-paced online courses (SPOCs) on critical thinking topics will compile collective portfolios of pre and post instructional materials that indicate enhanced strategies for improving students' critical thinking skills	IDEAs will be archived in the physical critical thinking resources centers and posted to the QEP/critical thinking website; IDEAs contributions may also be submitted to supervisors for performance evaluations
Spring 2007/ Ongoing	Pre and post faculty SPOC surveys (to be developed)	Faculty completing self-paced online courses (SPOCs) on critical thinking topics will be given pre and post surveys to assess the impact of the SPOC on their knowledge and perceptions of instructional strategies to improve students' critical thinking skills	Results will be used to improve existing and subsequent SPOCs
Summer 2007	Institutional Portfolio/ VECTR	Samples of student work from selected general education courses will be assessed by an interdisciplinary team	Critical thinking levels and percentage of assignments/artifacts that cannot be assessed will be reported by instructional area, credit hours completed, and type of assignment/ artifact
Spring 2008	CCSSE	CCSSE will be given to randomly selected sections	Student responses to CCSSE questions relating to critical thinking will indicate level of improvement
Summer 2008	Institutional Portfolio/ VECTR	Samples of student work from selected general education courses will be assessed by an interdisciplinary team	Critical thinking levels and percentage of assignments/artifacts that cannot be assessed will be reported by instructional area, credit hours completed, and type of assignment/ artifact
Summer 2009	Institutional Portfolio/ VECTR	Samples of student work from selected general education courses will be assessed by an interdisciplinary team	Critical thinking levels and percentage of assignments/artifacts that cannot be assessed will be reported by instructional area, credit hours completed, and type of assignment/ artifact
Summer 2010	Institutional Portfolio/ VECTR	Samples of student work from selected general education courses will be assessed by an interdisciplinary team	Critical thinking levels and percentage of assignments/artifacts that cannot be assessed will be reported by instructional area, credit hours completed, and type of assignment/ artifact
Spring 2011	CCSSE	CCSSE will be given to randomly selected sections	Student responses to CCSSE questions relating to critical thinking will indicate level of improvement
Summer 2011	Institutional Portfolio/ VECTR	Samples of student work from selected general education courses will be assessed by an interdisciplinary team	Critical thinking levels and percentage of assignments/artifacts that cannot be assessed will be reported by instructional area, credit hours completed, and type of assignment/ artifact
Fall 2011/ Spring 2012	Five-year impact report	CFCC will assess the impact of the QEP and prepare a five-year impact report	A comprehensive description of the impact of each QEP initiative will be developed and shared with all college constituencies